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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,434	02/27/2004	Xiang Liu	27-5-18	9785

7590 01/11/2007
Docket Administrator (Room 3J-219)
Lucent Technologies Inc.
101 Crawfords Corner Road
Holmdel, NJ 07733-3030

EXAMINER

TRAN, DZUNG D

ART UNIT	PAPER NUMBER
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2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/790,434

Applicant(s)

LIU ET AL.

Examiner

Dzung D. Tran

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-5, 9-12, 17 and 20 are rejected under 35 U.S.C. 102(a) as being anticipated by Leuthold et al. IEEE Photonics Technology Letters , Vol. 16, No.6, June 2004, Manuscript received December 24, 2003, revised February 9, 2004.

Regarding claims 1 and 20, Leuthold discloses in Figure 1, a method/apparatus comprising:

a laser and pulse generator for generating a phase-shift keyed optical signal;

and

propagating the optical signal through a semiconductor optical amplifier SOA in deep saturation to regulate the amplified optical power (page 1582).

Regarding claim 2, Leuthold discloses wherein the amplified optical power is regulated to about the saturation output power of the SOA (page 1583, left column).

Regarding claim 3, Leuthold discloses wherein the gain recovery time of the optical amplifier is larger than the bit period of the optical signal (page 1583, right column).

Regarding claim 4, Leuthold discloses wherein the optical signal has a data-independent intensity profile (page 1582).

Regarding claim 5, Leuthold discloses wherein the optical signal is an RZ-DPSK signal (page 1582).

Regarding claim 9, Leuthold discloses wherein ΔP_{out} (dB)/ ΔP_{in} (dB) of the optical amplifier is less than about 0.25, wherein P_{out} is the power of the optical signal output from the amplifier and P_{in} is the power of the optical signal input into the amplifier (see Figure 2 and page 1583).

Regarding claim 10, Leuthold discloses a method for optical limiting amplification comprising:

propagating a phase-shift keyed optical signal having a data independent intensity profile through a semiconductor optical amplifier such that ΔP_{out} (dB)/ ΔP_{in} (dB) is less than about 0.25, to regulate the amplified optical power, where P_{out} is the power of the optical signal output from the amplifier and P_{in} is the power of the optical signal input into the amplifier (see Figures 1 and 2; pages 1582-1583).

Regarding claim 11, Leuthold discloses wherein the gain recovery time of the optical amplifier is larger than the bit period of the optical signal (page 1583, right column).

Regarding claim 12, Leuthold discloses wherein the optical signal is an RZ-DPSK signal (page 1582).

Regarding claim 17, Leuthold discloses an optical signal processor apparatus comprising:

a semiconductor optical amplifier device adapted to operate in deep saturation and to receive an RZ-DPSK optical signal having an amplitude-shift keyed optical label portion, such that the optical label portion of the signal is removed upon propagation through the semiconductor optical amplifier device (page 1582).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6-8, 13-16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uda et al. US Patent no. 7,116,908 in view of Leuthold et al. IEEE Photonics Technology Letters , Vol. 16, No.6, June 2004, Manuscript received December 24, 2003, revised February 9, 2004.

Regarding claim 16, Uda discloses in Figure 3, a channel power equalizer comprising:

a demultiplexer 205 for demultiplexing an optical signal comprising a plurality of channels;

a multiplexer 204 for multiplexing the plurality of optical channels; and

a plurality of optical amplifiers 203 optically coupled to the demultiplexer and the multiplexer and adapted to provide optical power equalization of the plurality of channels.

Uda differs from claim 16 of the present invention in that he does not specifically disclose the optical amplifier is a semiconductor optical amplifier.

Leuthold discloses an apparatus for equalizing a channel power using a semiconductor optical amplifier (see Figure 1, page 1582).

At the time of the invention was made, it would have been obvious to an artisan to replace the optical amplifiers 203 of Uda with the semiconductor optical amplifier taught by Leuthold. One of ordinary skill in the art would have been motivated to do that in order to take the advantage of the SOA such as large wavelength range, small form factor and low power consumption.

Regarding claim 18, Uda discloses in Figure 3, optical add/drop multiplexer device comprising:

a demultiplexer 205 for demultiplexing an optical signal comprising a plurality of channels;

a multiplexer 204 for multiplexing at least one of the optical channels from the demultiplexer and at least one added channel; and

a plurality of optical amplifiers 203 optically coupled to the demultiplexer and the multiplexer and adapted to provide optical power equalization of the plurality of channels.

Uda differs from claim 16 of the present invention in that he does not specifically disclose the optical amplifier is a semiconductor optical amplifier.

Leuthold discloses a semiconductor optical amplifier as a power booster for RZ-DPSK transmitter (see Figure 1, page 1582).

At the time of the invention was made, it would have been obvious to an artisan to replace the optical amplifiers 203 of Uda with the semiconductor optical amplifier taught by Leuthold. One of ordinary skill in the art would have been motivated to do that in order to take the advantage of the SOA such as large wavelength range, small form factor and low power consumption.

Regarding claim 19, Leuthold discloses an optical signal processor apparatus comprising:

a semiconductor optical amplifier device adapted to operate in deep saturation and to receive an RZ-DPSK optical signal having an amplitude-shift keyed optical label portion, such that the optical label portion of the signal is removed upon propagation through the semiconductor optical amplifier device (page 1582).

Leuthold differs from claim 19 of the present invention in that he does not specifically disclose a plurality of semiconductor optical amplifiers. However, whether the apparatus comprises one SOA for equalizing one channel or a plurality SOAs for equalizing a plurality channels is merely an engineering design choices.

Regarding claims 6-8 and 13-15, Leuthold discloses wherein the optical signal is a DPSK signal (page 1582). Therefore, whether the DPSK signal is a $\pi/2$ -DPSK

signal or constant-intensity DPSK signal or RZ-DQPSK signal is merely an engineering design choices.

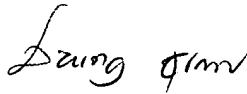
Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Zhou et al. U.S. Patent no. 6,400,479. Optical power balancer for optical amplified WDM networks
 - b. Yang U.S. Patent no. 6,091,743. Bandwidth broadened and power enhanced low coherence fiber optic light source
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dzung Tran
01/03/2006

DZUNG TRAN
PRIMARY PATENT EXAMINER